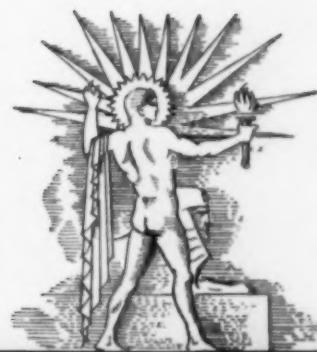
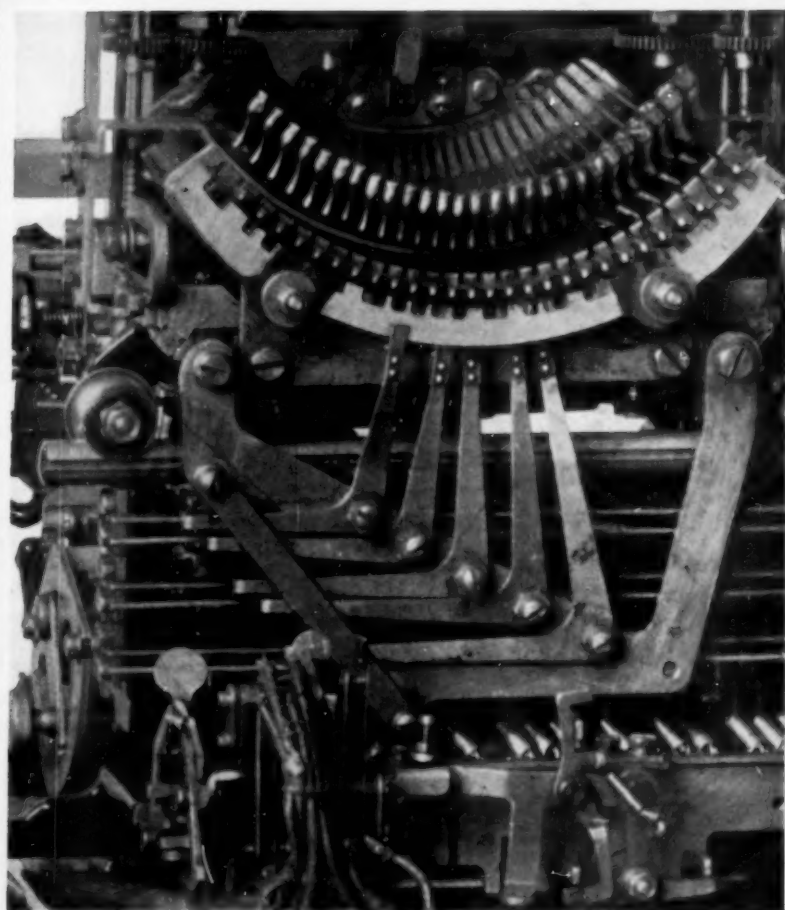


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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE.



APRIL 2, 1932

Writes Electric Words

See Page 212

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DO YOU KNOW THAT

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A sanctuary to the Crocodile God of Egypt has been found at Tebtunis.

Some of the white sand dunes in San Luis Valley, Colorado, rise to a height of about 1,000 feet.

Two Japanese doctors who studied the effects of night work on women in Japanese mills report that night workers lost weight and had less resistance to disease.

Orchard growers are advised that trees badly damaged by the drought should be uprooted, as they come in the class of "boarder trees" that do not pay their own way.

As far back as 1900 B.C., scholars of Babylonia were dealing with arithmetical progressions, quadratic equations, and equations with two unknown factors.

An inscription found at Delphi shows that in the first century B.C. Rome planned an international police system for the seas, to fight pirates and brigands.

There is evidence to support the old story that a swan fatally wounded may sing before it dies.

Several hundred Indiana farmers recently witnessed the plowing of a field by a radio-operated tractor.

A pliable rubberized material, resembling leather but not greatly affected by moisture, has entered the field as a competitor of leather.

The hour of the week during which you can drive your automobile with the least chance of having a fatal accident is Tuesday between four and five A. M., and the time of greatest risk is on Sunday afternoon between six and seven, according to a statistical study by an insurance company.

Argentina, which formerly imported most of its paper supplies, is now making a variety of papers from straw pulp.

In this country there are more misfed than underfed children, says a report of the White House Conference on Child Health and Protection.

WITH THE SCIENCES THIS WEEK

CURIOSITY-AROUSING questions are prepared concerning the most interesting and important news in each issue. These questions should be a mental stimulant for the adult reader and a boon to the teacher who uses the Science News Letter to add zest to her classroom instruction.

Book reference in *italic type* is not the source of information of the article, but a reference for further reading on the subject of the article. Books cited can be supplied by Librarian, Science Service, at publisher's price, prepaid in U. S.

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Are six-fingered hands hereditary? p. 212.
Heredity—A. F. Shull—McGraw-Hill, 1931, \$3.

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Where is Troy? p. 216

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BACTERIOLOGY

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Who's Who Among the Microbes—W. H. Park and A. W. Williams—Century, 1929, \$3.

BOTANY

Do buttercups like the water? p. 219

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What is the advantage of a "sugar" house? p. 208.
Creative Chemistry—Eduin E. Slosson—Century, 1919, \$3.

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How thinly spread on the average is the matter in the universe? p. 207. *The Universe Around Us*—Sir James Jeans—Macmillan, 1931, \$4.50.

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Of what value is it to know the force of gravity below the sea's surface? p. 209

PHYSIOLOGY

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What are the functions of the pituitary gland? Where is it located? p. 218

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ZOOLOGY

What do city skunks eat? p. 216

What is used to make salamanders lay out of season? p. 212

COSMOLOGY

Einstein and de Sitter Return To Euclidean Idea of Cosmos

Receding Nebulae and Heckmann's Suggestion Cause Eminent Scientists to Drop Theory of Curved Space

PROF. ALBERT EINSTEIN, father of relativity, says that space may be and probably is the sort of uncurved, three-dimensional space that Euclid imagined and countless generations of schoolboys have learned. Although Prof. Einstein in a sense scraps the less familiar and more complicated brands of space-time that he has been using, this does not affect the validity of relativity, which has been at the foundation of so much scientific thinking for the past two decades.

Worked Together

Prof. Willem de Sitter, Dutch astronomer, who had built his own shape of universe on Einsteinian foundations, joins with Prof. Einstein in espousing space which is on the average Euclidean. These two eminent astrophysicists conceived the new kind of universe when working together recently at Mt. Wilson Observatory and their joint announcement was made to the world through the medium of the *Proceedings of the National Academy of Sciences* just issued. Prof. Einstein is now en route to his home in Germany while Prof. de Sitter is travelling in South America.

This joint announcement, that is sure to cause a furore in the world of science, means that the universe around us may be not only unbounded but infinite, instead of finite and unbounded as Einstein and his followers have previously believed.

In the Euclidean universe now reenthroned, light travels in straight lines and goes on and on forever and ever. A ray of light would not traverse the circuit of the universe and come back to where it started as it would in the superseeded Einstein and other varieties of space. Curvature of space is on the average banished from the universe.

"We must conclude that at the present time it is possible to represent the facts without assuming a curvature of three-dimensional space," Profs. Einstein and de Sitter say in their report.

Two important developments made

Einstein and de Sitter change their universes. One of these was the piling up of evidence at Mt. Wilson Observatory at Pasadena, Calif., by Dr. Edwin P. Hubble and others that the shift toward the red of spectrum lines in light from far distant nebulae is evidence that the universe is expanding at a terrific rate, as high as 15,000 miles per second and that the farther away the nebula the faster the recession.

The other factor was the demonstration by Dr. Otto Heckmann, privatdozent in astronomy at the University of Goettingen, Germany, that an expanding universe can have matter throughout it and still be Euclidean. When Einstein built his first universe he did not dream of an expanding space. He thought it static and constant in size and found himself forced to make space curved to fit this idea. This gave his famous finite but unbounded universe which, upon Dr. Heckmann's suggestion, he and de Sitter now revise.

Red Shift in Light

Into the equations of Einstein relativity which have stood the test of time, Profs. Einstein and de Sitter, following Heckmann's lead, have inserted both Euclidean space and the recessional velocity of the nebulae indicated by the expanding universe idea and the Mt. Wilson measurements of red shift in light from the nebulae. The scientists were then able to compute the density of matter in the universe and found that it compares favorably with the ideas that are current as to how matter is spread throughout space on the average.

It is almost impossible to imagine how thinly spread on the average is the matter in the universe. One pound of matter spread throughout a sphere sixteen times the diameter of the earth would give this extremely small density of matter. And as the universe is expanding at a super-terrific rate at extreme distances outward, always getting larger as it were, the density of the matter in the universe must be getting less and less.

Profs. Einstein and de Sitter observe, however, that as more astronomical data are gathered it will undoubtedly be possible to determine with more precision the density of matter in the universe. If it should turn out that there is more matter per unit volume of space, then it will be necessary to return to the original Einstein space even with an expanding universe. If the matter is more sparsely distributed, it will be necessary to learn to live in a space of average negative curvature, such as Lobatschewski, the Russian scientist, dreamed of a century ago. In this strange space an infinite number of lines parallel to a given straight line can be drawn through any point. (Please turn page)



NEW WEAPON AGAINST CANCER

Seven hundred thousand volts will be made easily available to the California Institute of Technology scientists by two new giant X-ray transformers made by engineers of the General Electric Company. One of these, shown above, has already been shipped to the coast and the other is nearing completion.

Cancer research will benefit from the building of these new transformers, which will be used in the Kellogg Radiological laboratory to operate the X-ray tube of Prof. C. C. Lauritsen. Rays equal in penetration to those of radium at present used in treatment will be produced with their aid. Electricity from the mains at 220 volts, fed into these two transformers placed end to end, will come out at the other end as a total electric pressure of 2,000,000 volts.

The revision of the geometry of the universe by Profs. Einstein and de Sitter does not appreciably alter the geometry of the galaxy of stars in which we live. Consequently it leaves unaltered the theoretical predication originally made by Einstein which so triumphantly vindicated his theory. These are: The wriggling of the orbit of the planet Mercury, the red-shift of the

spectral lines in the sun and companion of Sirius, and the bending of light rays about the sun which is merely the Euclidean interpretation of a Riemann straight line. A straight line in Riemann curved space is curved when interpreted in Euclidean space. The geometry of an Einstein universe is based on the assumption that light travels in straight lines.

Science News Letter, April 2, 1932

COSMOLOGY

Cannot Know Universe's Shape Without More Observations

By PROF. RICHARD C. TOLMAN
California Institute of Technology

THE ARTICLE of Einstein and de Sitter in the Proceedings of the National Academy shows, if we assume a uniform distribution of material in the universe and assume the cosmological constant to be zero, that our present knowledge as to the density and velocity of recession of matter can be accounted for, if we ascribe the value zero to the spatial curvature of the universe. Our present observational data are thus shown to be insufficient to distinguish

between the three theoretically possible cases of positive, negative or zero curvature, and hence we cannot now say whether the universe is closed, hyperbolic or flat. It is possible that sufficient data to throw more light on such questions will be available in the not too distant future.

The article deals, of course, with the spatial curvature of the universe as a whole when looked at from a large scale point of view and does not affect our views as to the curvature of space in the neighborhood of individual gravitating bodies.

Science News Letter, April 2, 1932

CHEMISTRY

Research Pointing Way to Sugared Mortar in Walls

HOUSES built of candy, the creations of fancy in fairy tales, are making a strong bid to enter the realm of reality. At least, it may not be long before real, liveable houses are built with hundreds of pounds of sugar in their walls, for such houses will have stronger walls than those without sugar, scientists at the meeting of the American Chemical Society have revealed.

The facts about the "structural" strength of sugar were found in investigations to discover more industrial uses for the cane product, which were conducted at the Mellon Institute in Pittsburgh by Dr. Gerald J. Cox and Dr. John Metschl. They have concluded that the use of sugar in lime-sand mortar offers one of the most promising new ways of consuming large quantities of sugar.

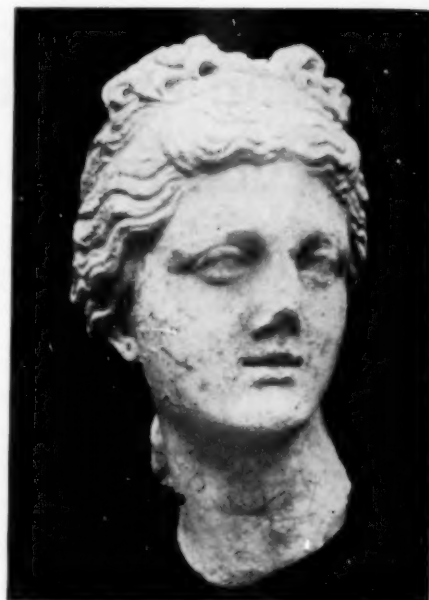
The addition of as little sugar as six

per cent. of the weight of quick-lime used will increase the tensile strength of the mortar 60 per cent., their studies show. Further seasoning produces slight increases in strength.

"Lime-sand mortar," the researchers explained, "possesses certain qualities of workability that are superior to cement mixtures or gypsum plasters, but it is lacking in strength. Lime mortar can regain many of its former uses if its strength can be increased.

"We have begun a series of experiments to test the effects of additions of small amounts of sucrose to lime-sand mixtures. Our plan includes tests of tensile strength, compression strength, time of setting, and durability on exposure to a variety of conditions, especially the action of water."

Science News Letter, April 2, 1932



SAUCY

—the new Venus just discovered by archaeologists of the University of Pennsylvania Museum digging at Minturno, Italy.

ARCHAEOLOGY

Broken Nose Gives Piquant Look to Dignified Venus

A VENUS with a broken nose and still beautiful, is the latest prize American archaeologists have unearthed at Minturno, Italy.

The goddess' classic nose was found slightly damaged at the end, but this accident, which would be fatal to beauty ordinarily, has merely wrought a subtle change in the goddess' personality type. Most statues of the Goddess of Love portray a lady of superior calm and poise. This Venus with her tip-tilted nose has a piquant look, and perhaps a sense of humor.

The new Venus is pronounced a Roman copy of Greek sculpture. It is one of a number of unusual art objects discovered by archaeologists representing the Museum of the University of Pennsylvania who are excavating at the ruins of Minturno. Dr. Jotham Johnson is directing the work.

Another new discovery is the base of a statue which is linked with Roman politics of the third century A. D. An inscription on the statue base says that the monument was erected by the citizens of Minturno in honor of Furia Sabinia Tranquillina, "august and most revered wife of Gordianus Pius."

Gordianus Pius was once Emperor of the tottering Roman Empire.

Science News Letter, April 2, 1932

BACTERIOLOGY-PHYSICS

Intense High-Pitched Sound Used to Kill Milk Bacteria

"Singing" Tube Placed in Liquid Produces Sonic Waves That Destroy Eighty Per Cent. or More of Organisms

MILK and similar liquids may some day be sterilized by subjection to a "terrific squeak" instead of by heat treatment. This possibility is visioned as a result of experiments by Dr. Leslie A. Chambers and Prof. Newton Gaines of Texas Christian University. The apparatus which they have constructed and used in their laboratories averaged a kill of 80 per cent. of all bacteria present in various samples of milk, and in a few samples it produced complete sterilization.

The new apparatus was evolved from an earlier form used by Prof. Gaines and Prof. O. B. Williams of the University of Texas last year. Basically it involves the same device: a nickel tube caused to vibrate intensely and at a high rate by being placed in a rapidly alternating magnetic field controlled by mechanism similar to that used in radio broadcasting. This causes the tube to "sing" with an exceedingly high-pitched audible note. Partially immersed in water or other liquid, its intense sound waves are very destructive to bacteria and other small organisms.

In the apparatus used last year, the experimenters killed bacteria in a flask. This year's endeavor was to develop a means of sterilizing or partially sterilizing liquids as they flowed past and around the tube, making the process continuous instead of intermittent. This was accomplished by inserting the upper half of the nickel tube into a larger tube of glass, making the joint by means of a water-tight rubber collar. The lower end of the tube was given the magnetic impulses, and the upper end drove its high-frequency sound waves into the milk as it flowed through the space between the two tubes, and especially as it flowed through a narrow funnel-shaped outlet.

The laboratory model was of sufficient size to allow continuous treatment of milk at the rate of 100 quarts an hour, but the nature of the apparatus is such that the capacity may be expanded almost without limit, the experimenters state.

With the cooperation of a commercial milk concern, the apparatus was tested on a large number of samples of Grade A milk, with initial bacterial counts varying from 8,000 to 30,000 per cubic centimeter. A few samples of pasteurized milk showing 3,000 to 5,000 counts were also tested, with results indicating that the vibration treatment destroys germs not affected by pasteurization temperatures.

Other liquids that may eventually be treated by the new method include certain dietary products and delicate sera for use in medicine—in general, products that require a radical reduction in germ count, if possible, without heating.

Science News Letter, April 2, 1932

OCEANOGRAPHY

Submarine Cruise Yields Data on Earthquakes

THE U. S. Submarine S-48, carrying a staff of scientists and apparatus designed for measuring the force of gravity under water, has arrived at Miami, ending a cruise among the West Indies begun on Feb. 7. The leaders of the expedition are Dr. Richard M. Field of

Princeton University and Dr. F. A. Vening Meinesz of the University of Utrecht and the Netherlands Geodetic Commission.

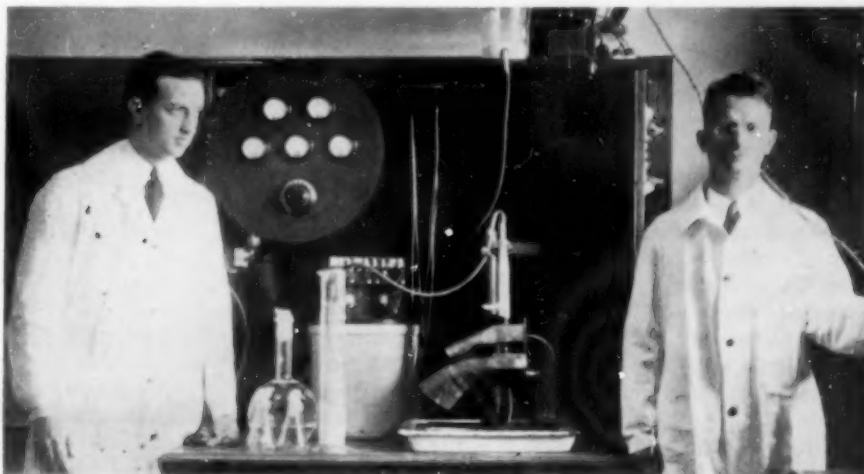
"This is the first time we were able to obtain real data which has a bearing on earthquakes," Dr. Field stated. "Dr. Meinesz has developed a specially constructed pendulum to determine gravitation. Once this was determined we were able to speculate as to the character of rock formations, columns of rocks of different kinds having certain gravity. With this certain gravity we can tell what kind of rock should be there and knowing that determine the topography of the sea floor and how it was produced.

"It will be three months before the field data and preliminary calculations which we have made are computed. From the isostatic reduction of these we can find if certain blocks are in or out of balance and whether they should go up or down."

With Dr. Meinesz' apparatus in the submarine, 55 dives were made to approximately 70 feet under the surface. Soundings were made every fifteen minutes coincidentally with the gravitation tests.

Four dives were made between Nassau and Miami. Fifty-one dives were made in 33 days from Feb. 7. The cruise made a total of 4,000 miles in three loops. The first was southward of Jamaica and around the west end of Cuba. The second around the Caicos bank through Caicos and Turks Island passage. The third was from Guantanamo through the Bahamas to Nassau and Miami.

Science News Letter, April 2, 1932



KILLING BACTERIA WITH HIGH-PITCHED SOUND WAVES

This new apparatus developed by Dr. Leslie A. Chambers, left, and Prof. Newton Gaines of Texas Christian University will in its present form kill 80 per cent. or more of all organisms in milk flowing through it at a rate of 100 quarts an hour.

ASTRONOMY

Added Attraction, Jupiter and Venus

Evening Skies This Month Are a Vernal Stage Set for the Performance of the Two Brightest of All the Planets

By JAMES STOKLEY

WITH the coming of April, the evening skies take on a typically vernal aspect. Orion, Taurus and the two dogs, Canis Major and Canis Minor, so conspicuous during the winter months, have descended low into the western sky. In their place shine Leo and Virgo in the south, while Vega, in the northeast, heralds the return of Lyra to the evening heavens. And this month there is the added attraction of the two brightest of all the planets.

Look to the south this evening about 9 o'clock. There shines the famous "sickle," with the blade pointing to the west and the handle hanging downwards. This marks the constellation of Leo, the lion, the blade being the animal's head, and the handle his forefeet. His hindquarters are made up of a triangle of stars to the east. The easternmost, and the brightest, of the stars in the triangle, is called Denebola, though it is not of the first magnitude. Just in front of the sickle, in the neighboring constellation of Cancer, is Jupiter, more brilliant than any nearby star.

A little to the south, and close to the horizon, can be seen part of the constellation of Orion. Early in the evening the entire group is visible, but by about nine o'clock only the three stars of the belt, and Betelgeuse, above them, remain. About as high above the horizon, but farther south, is the great dog, Canis Major, with the brilliant Sirius, brightest of all the stars, though its splendor is somewhat dimmed by reason of its being low in the sky, where much of its light is absorbed by the atmosphere. Above Sirius is another bright star, Procyon, which marks the lesser dog, Canis Minor. Just north of Procyon, and above Orion, are Gemini, the twins. Castor and Pollux are the names of the two brightest stars in this group, though only the latter, to the south, is of the first magnitude.

Below Gemini is Taurus, the bull, which, like Orion, has almost completely disappeared behind the horizon. But Aldebaran remains visible, until later in the evening. North of Taurus,

and a little higher, is Auriga, the charioteer, with Capella. Between Capella and Aldebaran, and far brighter than either, is the planet Venus.

But now let us turn to the east and see the constellations that are now coming into the evening sky. First look east of Leo and Jupiter, and there you see Virgo, the virgin, of which the brightest star is Spica. To the north of Virgo is Boötes, the herdsman, containing the first magnitude Arcturus.

Will Open Exposition

This is the star that will play an important part next year when the Chicago "Century of Progress" exposition is opened by means of its light. Focussed by the lens of the great Yerkes Observatory telescope on a photoelectric cell, the resulting electrical current will be amplified and carried over wires to Chicago, where it will start the exposition. Arcturus was chosen for the purpose because it is approximately 41 light years away, and the light which will reach the earth next year started on its journey when the Columbian exposition was being held in Chicago in 1892. Later in the evening, the star Vega can be seen low in the northeast. This is in the constellation of Lyra, the lyre.

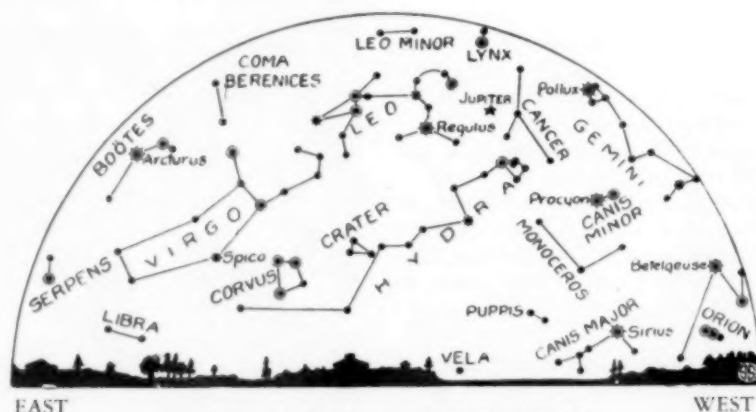
Without a doubt the best known of all the constellations, even though it contains no first magnitude stars, is the great bear, Ursa Major, or rather, the

part of the great bear that is usually designated, in the United States, as the "Great Dipper." This famous group is high overhead, a bit to the north of the zenith, now in its best evening position of the year. In other countries these seven stars have different names. The English, for example, refer to it either as "the plough," or "Charles's wain," while the Germans call it "der Wagen." In southern France it has been called "casserole," or saucepan.

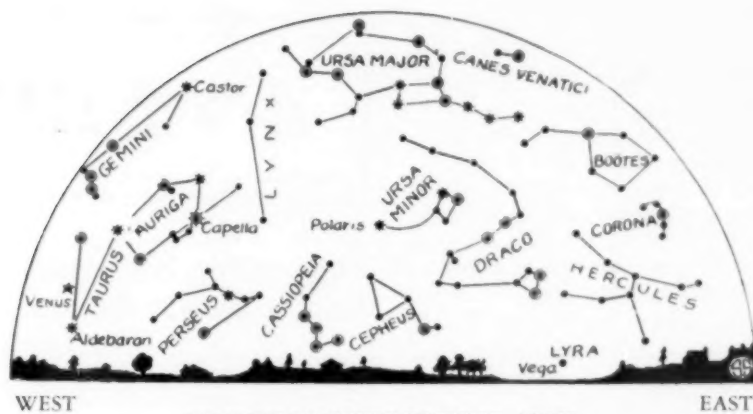
As a bear, the handle of the great dipper marks the animal's tail, which is surely extraordinary because no bear, living or dead, ever had such an appendage. To explain this Thomas Hood once wrote, "Imagine that Jupiter, fearing to come too nigh unto her (the bear's) teeth, layde holde on her tayle, and thereby drewe her up into the heaven; so that shée of herself being very weightie and the distance from the earth to the heavens being very great, there was great likelihood that her tayle must stretch. Other reason know I none."

A more scholarly explanation was given in the Century Dictionary. This is that the Sanskrit name for these stars, "Riksha," has two genders, one of which signifies a star and the other a bear. Hence, to a people unfamiliar with the true anatomy of a bear, the names might have become confused.

Opposite the handle of the dipper are the two stars commonly known as "the pointers," at the side of the bowl. If you imagine a line drawn from these



To the east in southern evening skies this month can be seen Arcturus. This is the star which will open up the Chicago Fair next year. Light from Arcturus, which started earthward in 1892, the date of Chicago's Columbian Exposition, will be focussed on a photoelectric cell thereby generating an electric current.



NORTHERN SKIES DURING APRIL

The best known of all the constellations, even though it contains no first magnitude stars, is the Great Bear, Ursa Major, part of which is generally designated as the Big Dipper. This famous group is high overhead now and in its best position of the year.

two stars, it will pass close to Polaris, the pole star, and the brightest orb in the constellation of Ursa Minor, the lesser bear.

By far the most brilliant object in the April evening skies, except, of course, the moon, is the planet Venus, now shining so brilliantly in the west. Venus, like the earth, and all the other planets, revolves around the sun. But the orbit of Venus is within that of the earth. We are approximately 92,900,000 miles from the sun while Venus averages only 67,170,000 miles. That means that it can never be seen far from the sun. It seems to oscillate about that body, sometimes appearing east, and sometimes west. When almost in line with the earth and the sun, either between the two, or on the side of the sun opposite the earth, it is invisible. This month, on the nineteenth, it is farthest east, and on that day it will set latest in the evening. Afterwards, it will start moving towards the sun, to disappear from view in a few months, only to reappear on the western side, and to be visible in the east before sunrise during the autumn months.

Once Every 584 Days

On June 29, when just halfway between its disappearance from the evening sky, and its reappearance in the morning, Venus will be almost directly between the sun and earth, at what astronomers call inferior conjunction. This happens once every 584 days. Usually, when it happens, Venus does not pass across the face of the sun, but above or below it. At rare intervals, however, the planet comes directly between the sun and us, and then Venus can be seen as a black spot moving

across the solar disc. This is called a transit of Venus, and is a very rare astronomical event, far rarer than a total eclipse. The last occurred on December 6, 1882, while the next will not be until June 7, 2004.

Another occurred on June 3, 1769, and is particularly important in astronomical history because it was observed in the United States by David Rittenhouse, the pioneer American astronomer, in Philadelphia. This was done with the cooperation of the American Philosophical Society, of which he was later president, and which had been founded by Benjamin Franklin. Some of the observations were made from a platform erected in Independence Square, as it is now called, immediately in back of the old State House, or Independence Hall. It is said that this platform remained there for some years, and in 1776, when the Declaration of Independence was first given to the public, the speaker stood on this vantage point to read it.

During this present month of April, 1932, there is being celebrated the two hundredth anniversary of the birth of Rittenhouse. It was on April 8, 1732, that David was born in a house that is still standing on Lincoln Drive, in Philadelphia. Thus he was born the same year as Washington, and it is interesting to note that two of his greatest astronomical contemporaries, Maskelyne, who was to become Astronomer Royal of England, and Lalande, who occupied a similar post in France, were also born in 1732.

Rittenhouse spent his boyhood and early manhood at Norriton, near Norristown, Pa., where he became interested in things scientific and mechanical, and by 1749 he was already established

as a clock maker. In addition to a number of clocks, of which the most elaborate is now at the Drexel Institute, in Philadelphia, he made two famous orreries, or models to show the motions of the heavenly bodies. The first of these went to Princeton University, and is no longer in existence, but the second, the more elaborate, has been carefully preserved by the University of Pennsylvania, for whom it was made. It has been loaned to the Franklin Institute. Restored to its original working order, it will be one of the main features of the new Franklin Institute Museum. One part of the orrery showed the date, time, place and duration of eclipses of the sun, for a period of 5000 years before and 5000 years after it was constructed. No other instrument ever conceived has been capable of this.

In addition to his observations of the transit of Venus in 1769, which made possible a more accurate determination of the distance of the earth from the sun than had previously been made, Rittenhouse also made the first careful observation of an eclipse in the colonies. This was on June 24, 1778, the last total eclipse visible from the region of Philadelphia.

Rittenhouse was also known as a surveyor, and determined practically the whole boundary of Pennsylvania, laying the foundation for the work of Mason and Dixon in 1766. Also active in affairs of state, he deservedly ranks as one of the greatest men of his time.

Science News Letter, April 2, 1932

ORNITHOLOGY

Japanese Beetle Has Foes In Sparrow and Starling

ENGLISH SPARROW and European starling, much berated as pests of the first order, have at least one use in the world, says Dr. Thomas E. Winecoff of the Pennsylvania Game Commission, in a report to the headquarters of the National Association of Audubon Societies. They are destroyers of a much worse pest, the Japanese beetle.

Not many birds will eat Japanese beetles, Dr. Winecoff says, but sparrow and starling are joined in their attack by two of our commonest song-birds, themselves occasionally looked upon as nuisances by orchardists: robin and purple grackle. And down on the ground an introduced game bird, the ringnecked pheasant, lends a helping hand, or rather beak, in the good work of beetle destruction.

Science News Letter, April 2, 1932

ZOOLOGY

Salamanders Induced to Lay Eggs for Science

SALAMANDERS lay eggs to order for science at the American Museum of Natural History. As a result, previously unknown eggs of certain species have been described and light shed on the racial history of these odd little relatives of frogs and toads, that inhabit the ponds and streams over most of the United States.

The salamanders do not cooperate of their own accord, however. An implant of a part of the pituitary gland of another salamander is necessary before eggs will be deposited out of season. The implanting was accomplished by Dr. G. K. Noble and L. B. Richards of the museum staff, and 45 individuals of one species of the amphibian were induced to lay eggs in the laboratory.

In the case of the salamander, *Stereochilus marginatum*, whose eggs were unknown before the investigation started, the female was found to turn upside down while depositing her eggs. This action was construed as a retention of the habits of mountain brook ancestors which attached their eggs to the underside of stones.

The investigators had at their disposal adults of both sexes of a species of salamander from the Olympic Mountains of Washington. No courtship behavior between the two was noted, however, and no eggs were laid. Then the pituitary technique was resorted to with gratifying success. It was also learned during the experimentation that implants from the pituitary gland will build up the ovaries of a spent female salamander.

Science News Letter, April 2, 1932

PHYSIOLOGY

Idiots and Epileptics Have Nearly Normal Blood

BLOOD SAMPLES from feeble-minded persons and epileptic sufferers have been analyzed by Dr. Sidney S. Negus of the Medical College of Virginia and found to be nearly normal. His results were reported to the American Chemical Society.

Low content of cholesterol, alcoholic constituent of brain and nerve tissue, was one exceptional feature common in the blood of the thirty idiots and fifty epileptics found by Dr. Negus. It is impossible, however, Mr. Negus said, to

state the significance of this result.

The oxygen content of venous blood was also found to vary somewhat from normal.

Inorganic and "acid-soluble" phosphate, lecithin, hemoglobin, red cell count and cell volume of the blood were found to be within normal limits for the feeble-minded subjects. Calcium, total protein, non-protein nitrogen, albumin-globulin ratio, oxygen capacity and content, were normal for epileptics.

Blood samples were taken during or immediately after seizures in the case of the epileptics. Red cell count, hemoglobin, sex, age, diet and severity of attacks were also considered.

Science News Letter, April 2, 1932

ANATOMY

Anatomist Cites 56 Cases Of Six-Fingered Hands

FIFTY-SIX CASES of hands bearing an extra little finger were reported by Dr. Harold Cummins, professor of anatomy at Tulane University, to the American Association of Anatomists.

The extra finger was either attached to the fifth finger or to the margin of the palm of the hand. They were small and generally had poorly developed nails or no nails at all. Most of them were doubly unusual in that they dangled on a thin stalk by which they were attached to the hand. They looked as if a tight band had been tied around them at their base, Dr. Cummins said in describing them. He found, however, that this narrow base was not caused by any pinching. That part of the extra finger had grown more slowly than the rest of the finger from the earliest stage of its development in the embryo.

Sometimes these extra little fingers drop off. That is because the narrow base cramps the blood vessels passing through it so that they become congested. Eventually the rest of the finger becomes gangrenous and finally drops off. Generally they are cut off early in infancy. Partly because of this and partly because it is rather a rare condition, Dr. Cummins found it took a long time to gather enough cases for his investigation of the significance of the narrow stalk. It took 10 years to get 35 cases in New Orleans, he said.

The condition is hereditary. Dr. Cummins told about one Negro family in which the mother and six of the nine children had it. It is slightly more common in Negroes than in whites.

Science News Letter, April 2, 1932

IN SCIENCE

PHYSIOLOGY

Vegetarians in Europe Live at Slower Rate

THE BASIC life processes of vegetarians proceed at a slower rate than those of meat-eaters, in Europe as well as in America, measurements by Prof. G. Wakeham of the University of Colorado show. His results were reported to the American Chemical Society at New Orleans.

Prof. Wakeham made measurements of the basal metabolism, the body's rate of expending energy when resting, for fifteen strict life-time European vegetarians. He found that their basal metabolic rates were, on the average, nine per cent. below the normal rate.

Seven to ten years of vegetarianism, said Prof. Wakeham, are required to produce this effect. This was found by examination of vegetarians of from one to fifteen years standing.

Prof. Wakeham recently made a similar study of American vegetarians.

Science News Letter, April 2, 1932

COMMUNICATION

Teletypewriters Can Now Be Used in Home

See Front Cover

ON THE COVER of this issue of the SCIENCE NEWS LETTER is shown a portion of the mechanism of the teletypewriter, a hybrid medium of communication. The new teletypewriter service is a telegraph system with telephone methods and typewriting thrown in for luck. It is now possible to use teletypewriters, formerly restricted to specialized fields, in either the home or office after the manner of a telephone. A nationwide hook-up of teletypewriter stations is responsible.

Teletypewriters transmit typewritten messages electrically so that whatever is typed at one end of the circuit is typed simultaneously at the distant end. The hub of the teletypewriter service, recently inaugurated by the American Telephone and Telegraph Company, is the familiar switchboard operator, who, however, has a typewriter before her instead of a telephone set.

Science News Letter, April 2, 1932

SCIENCE FIELDS

PHYSIOLOGY

Cat Hears Better When Internal Ear is Plugged

PLUGGING an opening into the internal ear to reinforce its covering membrane made reception of sound through the cat's ear better than normal, Dr. Walter Hughson and Dr. S. J. Crowe of the Otological Research Laboratory, Johns Hopkins Medical School, reported to the American Association of Anatomists. Their discovery was made in the course of research into the causes of deafness, which it is hoped will lead to finding a method of arrest or prevention of the condition.

Previously these investigators had found that strengthening with cotton the covering of this opening, called the round window, increased the sensitivity of the inner ear for spoken words and tuning fork tones because it kept the window membrane from absorbing sound waves. The cotton plug, however, could only be a temporary measure, so a graft of periosteum, the tough outer coat of bone, was tried. The graft remained in position and was successful in increasing the efficiency of the normal ear. The intensity of all sounds transmitted was increased many per cent.

The operation so far has only been performed on cats with normal hearing. It is hoped that the method may eventually have definite application in clinical cases of deafness.

Science News Letter, April 2, 1932

ETHNOLOGY

Indians Evolved Idea of Serpent as Evil Agent

A DRAMATIC STORY of how a wily serpent tempted a woman, long ago when the earth was young, and how the fall of humanity was the result, has been discovered among folklore of Pueblo Indians.

The serpent's role as tempter of a woman is the only point which the Indian tale of creation has in common with the Bible story related in the Book of Genesis. Ethnologists at the Bureau of American Ethnology do not believe that the Indians took this incident from

the Biblical story, but evolved it independently.

The fact that on both sides of the world the serpent was selected as an instrument of evil was brought out when Keresan Indians from Acoma Pueblo visited the Bureau recently. The Indians talked with Prof. C. Daryll Forde, of the University of Wales, who happened to be a visitor at the Bureau at the time. From the Indians, Prof. Forde learned their version of how the world was created, and he has now reported it.

The Pueblo Indians told Prof. Forde that in the beginning of life, two female human beings were born and left to grow up in a dark place under the earth. Their father, who dwelt in the fourth sky above, had made them in his own image. When the two women were full grown, a spirit was sent to them, bringing two baskets containing seeds and tiny images of different animals.

With many adventures, the two first women of earth found their way to the surface of the world. Then they quarreled, and one woman, who was very lonely, listened to the tempting voice of the serpent which told her to go to the rainbow for companionship. She bore two children of this alliance. But the father in the fourth sky had other plans for populating the world, and in anger he refused to help these wilful children any more. So, it appears, sin and death were introduced into the world.

According to the legend, one of the two first sisters founded the red race and the other the white race.

Science News Letter, April 2, 1932

ANATOMY

Century-Old Shoes Too Small for Modern Woman

THE MODERN miss who cannot fasten Great Grandmamma's dress around her waist cannot squeeze her feet into Great Grandmamma's tiny shoes, either, it appears from experience in a demonstration of genuine period clothes recently held at Bristol, England. The clothes dated back to 1780. None of the modern ladies taking part in the demonstration could wear the shoes belonging to the earlier costumes because they were much too small.

Exercise and healthier life may be the cause of the change in size, if women's feet really were so much smaller 100 years ago, Dr. J. T. Irving of the physiology department of the University of Bristol suggested in a note to *The Lancet*.

Science News Letter, April 2, 1932

PHYSIOLOGY

Color and Quality of Hair Undergo Striking Change

A STARTLING but natural change in hair color and quality that out-rivals anything produced in modern hair-dressing establishments, even in Hollywood, has just been reported by Dr. Fred Wise of the New York Post-Graduate Medical School and Hospital and his associate, Dr. Marion B. Sulzberger, to the *Archives of Dermatology and Syphilology*.

The patient, a young man of 21 years, found that his hair which had been light brown, straight and healthy, changed in the course of two years to become black, "woolly and kinky" at the front, over the temples and on the top. The physicians found no abnormal change in the structure of most of the kinky hairs. Some of them were split at the ends.

Science News Letter, April 2, 1932

ACADEMIC FREEDOM

Scientific Boycott of Fascism is Proposed

WHAT AMOUNTS to a boycott of a scientific meeting to be held in Italy during the coming summer is proposed by Prof. A. J. Carlson of the University of Chicago. The proposal comes as a result of the demand by the Italian government upon Italian professors to swear allegiance to the Fascist regime.

Writing in *Science*, Prof. Carlson says:

"Next summer the International Physiological Congress is scheduled to meet in Rome. In this connection I wish to call the attention of the members of the Federation of American Biological Societies, who are members of this congress, to the official edict issued by the Italian government on October 8, 1931, compelling all professors in Italian universities to swear allegiance to the Fascist regime. As announced in *School and Society* for January 9 eleven university professors out of 1,225 have refused to take this oath of allegiance.

"I wish to propose to the members of the Federation of American Biological Societies for the coming meeting in Philadelphia in April the consideration of refusing to attend the International Congress of Physiology in Rome August next unless this brutal and defiant attack on academic freedom on the part of the Italian government is rescinded."

Science News Letter, April 2, 1932

ASTRONOMY

Rittenhouse and the Transit of Venus

"A Classic of Science"

Washington's Contemporary Built His Own Telescope
And Observatory for This Rare Astronomical Event

AN ACCOUNT OF THE TRANSIT OF VENUS OVER THE SUN'S DISC, as observed at Norriton, in the County of Philadelphia, and Province of Pennsylvania, June 3d, 1769.

By William Smith, D. D., Provost of the College of Philadelphia, John Lukens, Esq.; Surveyor-General of Pennsylvania, David Rittenhouse, A.M., of Norriton, and John Sellers, Esq.; Representative in Assembly, for Chester County—

Being the Committee appointed for that Observation, by the American Philosophical Society, held at Philadelphia, for promoting useful knowledge.

Communicated to the Society, July 20th, 1769, by Direction, and in Behalf of, the Committee; by Dr. Smith.

Published in Transactions of the American Philosophical Society, Vol. I., from Jan. 1st, 1769, to Jan. 1st, 1771. Philadelphia, M.DCC.LXXI. (1771).

AMONG the various public spirited designs, that have engaged the attention of this Society, since its first Institution; none does them more honor than their early resolution to appoint Committees, of their own Members, to take as many observations, in different places, of that rare Phaenomenon, the Transit of Venus over the Sun's Disc, as they had any probability of being able to defray the expence of, either from their own funds, or the public assistance they expected.

As the members of the Norriton-Committee live at some distance from each other, I am, therefore, at their request, now to digest and lay before you, in one view, the whole of our observations in that place; distinguishing, however, the part of each observer; and going back to the first preparations. For I am persuaded that the dependence, which the learned world may place on any particular Transit-Account will be in proportion to the previous and subsequent care, which is found to have been taken in a series of accurate and well conducted observations, for ascertaining the going of the time-pieces, and fixing the Latitude

and Longitude of the places of observation, &c.

And I am the more desirous to be particular in these points; in order to do justice to Mr. Rittenhouse, one of our Committee; to whose extraordinary skill and diligence is owing whatever advantage may be derived, in these respects, to our observation of the Transit itself. It is further presumed, that Astronomers, in distant countries, will be desirous to have not only the work and results belonging to each particular Transit-Observation, but the materials also, that they may examine and conclude for themselves. And this may be more particularly requisite, in a New Observatory, such as Norriton, the name of which hath perhaps never before been heard of by distant Astronomers, and therefore, its latitude and longitude are to be once fixed, from principles that may be satisfactory of the present, as well as on any future, occasion. . . .

As Mr. Rittenhouse's dwelling at Norriton is about 20 miles North-West of Philadelphia, our other engagements did not permit Mr. Lukens or myself, to pay much attention to the necessary preparations; but we knew that we had entrusted them to a gentleman on the spot, who had joined to a compleat skill in Mechanics, so extensive an astronomical and mathematical knowledge, that the use, management, and even the construction, of the necessary apparatus, were perfectly familiar to him. Mr. Lukens and myself could not set out for his house till Thursday, June 1st; but, on our arrival there, we found every preparation so forward, that we had little to do, but to examine, and adjust our respective telescopes to distinct vision. He had fitted up the different instruments, and made a great number of observations, to ascertain the going of his Time-Piece, and to determine the latitude and longitude of his Observatory. The laudable pains he hath taken in these material articles, will best appear from the work itself, which he hath committed into my hands, with the following modest introduction; giving me

NEXT TRANSIT JUNE 8, 2004

Venus passes across the sun's disk, as seen from the earth, four times every 243 years, in pairs of transits 8 years apart. The first transit observed by astronomers was on December 4, 1639. It had been calculated by Jeremiah Horrocks, a clergyman, who observed it; end, but missed the beginning because he had to hold services at the time.

The next pair of transits occurred in June, 1761 and 1769. The second of these was visible in the United States and was observed by Rittenhouse and his friends.

The transits of December 1874 and 1882 were studied by the great American astronomer Simon Newcomb. June 8, 2004 will be the date of the next transit of Venus, to be followed by one on June 6, 2012.

a liberty, which his own accuracy, care and abilities, leave no room to exercise.

Norriton, July 18, 1769

Dear Sir,

"The inclosed is the best account I can give of the Contacts, as I observed them; and of what I saw during the interval between them. I should be glad you would contract them, and also the other papers, into a smaller compass, as I would have done myself, if I had known how. I beg you would not copy any thing merely because I have written it, but leave out what you think superfluous.

I am, With great esteem and affection, Yours, &c.

DAVID RITTENHOUSE."

The Preparations

It hath been mentioned before, that it was on Thursday afternoon, June 1st, that Mr. Lukens and myself arrived at Norriton, with a design to continue with Mr. Rittenhouse 'till the transit should be over. The prospect before us was

Muscle for muscle and bone for bone, the gorilla is more like man than he is like the lower monkeys.

Thomas Huxley

points out these resemblances in hands and feet in the next two

CLASSICS OF SCIENCE

very discouraging. That day, and several preceeding, had been generally overcast with clouds, and frequent heavy rains; a thing not very common for so long a period at that season of the year in this part of America. But, by one of those sudden transitions, which we often experience here, on Thursday evening, the weather became perfectly clear, and continued the day following, as well as the day of the *Transit*, in such a state of serenity, splendor of sunshine, and purity of atmosphere, that not the least appearance of a cloud was to be seen.

June 2d, and the forenoon of June 3d, were spent in making the necessary preparations, such as examining and marking the foci of our several telescopes, particularly the reflector, with and without the micrometer. The reflector was also placed on a polar axis, and such supports contrived for resting the ends of the refractors, as might give them a motion as nearly parallel to the equator as such hasty preparations would admit. Several diameters of the Sun were taken, and the micrometer examined by such other methods as the shortness of time would allow.

The Sun was so intensely bright on the Day of the *Transit* that instead of using the coloured glasses sent from England with the Reflector, I put on a deeply-smoked glass prepared by Mr. *Lukens*, which gave a much more beautiful, natural and well-defined appearance of the Sun's Disk. The smoked glass was fastened on the Eye Tube with a little bees-wax, and there was no occasion to change it during the whole day, as there was not the least cloud, or intermission of the Sun's splendor.

Mr. *Rittenhouse*, in his previous projection had made the first external contact to be, June 3d, 2^h. 11' for lat. 40° N. and long. 5^h. W. of *Greenwich*; on a supposition of the Sun's horizontal parallax being 8". He happened to be very near the truth. For at 2^h. 10' 33" mean time, the 1st external contact was at *Norriton*, lat. 40°. 9'. 56" N. and long. 5^h. 1'. 31" west. Other calculations made it generally from 6' to 8' later for the same latitude and longitude.

Tho' this calculation was not given, to be entirely depended on, yet it was sufficient to make us keep what, in the sea-phrase, would be called a *good look-out*; and therefore, at one o'clock, we took off the Micrometer, which had been fitted to the Reflector with a power of 95, and adjusted it to distinct vision, with the same power to observe the

Contacts. And during the hour that was to intervene from one to two, we resolved to keep an alternate watch through the Reflector, on that half of the Sun's limb, where *Venus* was certainly expected to touch; while the others, not thus employed, were fixing what more remained to be done, as follows, viz.

First, That each of us might the better exercise our own judgment, without being influenced, or thrown into any agitation by the others, it was agreed to transact every thing by signals, and that one should not know what another was doing. The Situation of the Telescopes, the two Refractors being at some distance *without* the Observatory, and the Reflector *within*, favoured this design.

Secondly, Two persons, Mr. *Sellers*, one of our Committee, and Mr. *Archibald McClean*, both well accustomed to matters of this kind, were placed at one window of the Observatory, to count the clock and take the signal from Mr. *Lukens*. Two of Mr. *Rittenhouse's* family, whom he hath often employed to count the clock for him in his observations, were placed at another window to take his signal. My Telescope was placed close by the clock, and I was to count its beats, and set down my own time.

These preliminaries being settled, we prepared at two o'clock to sit down to our respective Telescopes; or (I should rather say) lie down to the Refractors, on account of the Sun's great height.

As there was a large concourse of the inhabitants of the county, and many from the city, we were apprehensive that our scheme for silence might be defeated, by some of them speaking, when they should see any of the signals for the Contacts; and therefore we found it necessary to tell them that the success of our observation would depend on their keeping a profound silence 'till the Contacts were over. And to do them justice, during the 12' that ensued, there could not have been a more solemn pause of silence and expectation, if each individual had been waiting for the sentence that was to give him life or death. So regular and quiet was the whole, that, far from hearing a whisper, or word spoken, I did not even hear the feet of the counters, who passed behind me from the windows to the clock; and was surprised when I turned from my Telescope to the clock, to find them all there before me, counting up their seconds to an even number; as I imagined, from



DAVID RITTENHOUSE

America's first important astronomer. He was two months younger than George Washington, and his bi-centenary is being celebrated in Philadelphia on the eighth of April.

the deep silence, that my associates had yet seen nothing of *Venus*.

As the Contacts are among the most essential articles relative to this phenomenon, it is material, before we set down the *times*, to give a particular account of the manner in which each observer judged of them, and the circumstances attending them.

Mr. Rittenhouse's Account

At 2^h. 11'. 39" per clock, the Revd. Mr. *Barton of Lancaster*, who assisted me at the Telescope, on receiving my signal, as had been agreed, instantaneously communicated it to the counters at the window, by waving a handkerchief; who walking softly to the clock, counting seconds as they went along, noted down their times separately, agreeing to the *same second*. And three seconds sooner than this, to the best of my judgment, was the time when the least impression made by *Venus* on the Sun's limb, could be seen by my Telescope.

When the Planet had advanced about one third of its diameter on the Sun, as I was steadily viewing its progress, my sight was suddenly attracted by a beam of light, which broke through on that side of *Venus* yet off the Sun. Its figure was that of a *broad-based pyramid*; situated at about 40 or 45 degrees on the limb of *Venus*, from a line passing through her center and the Sun's, and to the left hand of that line as seen through my Telescope, which inverted. About the same time, the Sun's light began to spread round *Venus* on each side, from the points where

their limbs intersected each other.

As *Venus* advanced, the point of the Pyramid still grew lower, and its circular Base wider, until it met the light which crept round from the points of intersection of the two limbs; so that when half the planet appeared on the Sun, the other half yet off the Sun was entirely surrounded by a semi-circular light, best defined on the side next to the body of *Venus*, which continually grew brighter, till the time of the internal contact.

Imagination cannot form any thing more beautifully serene and quiet, than was the air during the whole time; nor did I ever see the Sun's limb more perfectly defined, or more free from any tremulous motion; to which his great altitude undoubtedly contributed much.

When the internal contact (as it is called) drew nigh, I foresaw that it would be very difficult to fix the time with any certainty, on account of the great breadth and brightness of the light which surrounded that part of *Venus* yet off the Sun. After some consideration, I resolved to judge as well as I could of the co-incidence of the limbs; and accordingly gave the signal for the internal contact, at 2^h. 28' 45" by the clock . . . and immediately began to count seconds, which any one, who has been accustomed to it, may do for a minute or two, pretty near the truth. In this manner I counted no less than 1' 32" before the effect of the atmosphere of *Venus* on the Sun's limb wholly disappeared; leaving that part of the limb as well defined as the rest. From this I concluded that I had given the signal for the internal contact too soon; and the times given by the other observers at *Norriton* confirm me in this opinion.

Science News Letter, April 2, 1932

ZOOLOGY

"Riotous Living" Doubles Weight of Town Skunk

THE PRODIGAL skunk that deserts his country home and goes to live in town increases his substance by riotous living.

Prof. J. W. Hamilton, Jr., of Cornell University, has examined nearly five hundred specimens of skunks, and finds that those caught in towns weigh ten or twelve pounds, as against five or six pounds for their countrybred brethren. The town skunks' stomachs showed that they were devotees of the easy living offered by garbage piles; they contained breadcrumbs, meat, eggshells and fruits.

Science News Letter, April 2, 1932

COSMOLOGY

Entire Universe Still Young, Little Older than Earth Itself

THE FAR-FLUNG universe of stars, nebulae and star-dust is not much older than the solar system and the earth itself.

This startling conclusion was presented by Dr. Ernst J. Opik of Tartu University Observatory, Esthonia, now serving as lecturer in astrophysics at Harvard, who closed a symposium on the time scale held during the dedication of the new Harvard Observatory astrophotographic building.

Facts gathered by Dr. Opik indicate that the age of our universe is not very much more than 3,000 million years. The probable length of known geologic time is something like 1800 million years.

This reduction in the time that the universe could have existed may have far-reaching effects on astronomical theory and conceptions. It deals a severe blow to the idea that the universe of stars and nebulae is an outgrowth of a process of relatively slow evolution.

"We infer that not much more than 3,000 million years have elapsed since the spiral nebulae, the stars, and the star-dust or meteors were born out of the original parent system, which we call chaos because we do not know much about it," Dr. Opik said.

Most impressive was evidence of the universe's youth brought to earth by meteorites or "falling stars." Dr. Opik reported that Prof. Fritz Paneth, chemist at the University of Königsberg, Germany, has determined the age of a number of meteorites by analyzing their relative contents of helium and radium. He found values ranging from 100 to 2,900 million years. Pultusk stone meteorites which were seen to fall in 1868 gave a preliminary age of 500 million years, which due to loss of helium in space and in museums during sixty years is probably a minimum age. Astronomers are confident that these meteorites came from interstellar space. These chemical determinations of age suggested to Dr. Opik a low age for the stellar universe.

Double stars also shine evidence that the universe is young. Dr. Opik found that statistics of the distribution of distances and relative magnitudes in double stars indicate that since their origin

the masses of the stars could not have decreased appreciably. The drop in luminosity of an average dwarf star since its origin can not have been more than half a magnitude, Dr. Opik found as another indication of the universe's youth.

"Stars of different spectral classes cannot have evolved from one another," he said. "They must have been created simultaneously and their age is too short for any appreciable evolution."

The terrific rushing away of the nebulae as signalled in the reddening of their light, which is considered evidence of an expanding universe, indicates, in Dr. Opik's opinion, a possible age of the extragalactic universe of only a few thousand million years.

Ten years ago the universe was thought to be ten million million years old; now Prof. Opik divides these old estimates by a million or so and makes the universe about the same age as the earth, about three thousand million years.

Science News Letter, April 2, 1932

ARCHAEOLOGY

Doubt Raised That Troy Is Located Correctly

THE TROY that millions of high school students have laboriously located on the map of Asia Minor may not be the Troy of Homer, after all.

Critics are raising new doubts that Hissarlik, commonly accepted to be Troy, fits the specifications of the historic city. The mound of Hissarlik was excavated by Heinrich Schliemann in 1870, and ruins of nine successive cities were found on the site. The sixth of these cities, built about 1500 B. C. and destroyed some three centuries later, is the one known as the Trojan War city.

Homeric scholars are disturbed by the revival of doubts, long dormant, that Hissarlik is the scene of Troy, reports *Antiquity*.

The latest declaration that the site of Troy must still be sought is by a French scholar, M. Vellay. The Greek ships that sailed to Asia Minor for the siege of Troy must have been drawn up on the Hellespont, M. Vellay emphatically

argues. But this could not have been done at the shore near Hissarlik, because there is not room for the camp and the maneuvers.

Disagreeing with this view, in *Antiquity*, Miss Winifred Lamb, British archaeologist, declares that M. Vellay demands geographical accuracy from a poet whose very identity is obscure. The *Iliad* has its roots in the folk-memory of the dark ages, she says and was often pruned before it grew to its final form.

Although she dismisses M. Vellay's geographical argument as not strong enough to wreck Hissarlik's reputation for being the scene of Troy, Miss Lamb states that the important region around Hissarlik is too little known, and should be further explored.

Science News Letter, April 2, 1932

EVOLUTION

Would Study Effect of Radium Find on Evolution

DO THE GREAT deposits of radium ore recently discovered in northern Canada have any effects in speeding up the rate of evolution of the plants and animals in their neighborhood?

This question has been raised in *Science* by Prof. W. C. Broadfoot of the University of Alberta. Prof. Broadfoot calls attention to the now well known ability of X-rays to speed up evolutionary change, first demonstrated to the scientific world by Prof. H. J. Muller of the University of Texas. The effects of radiations from radium and other radioactive substances have also been the subject of numerous experiments, and of observations on living organisms in regions of high natural radioactivity in the earth.

In the latter localities there have been some apparently positive results, but of so small a magnitude as to leave the question still in doubt. But the newly discovered deposits of pitchblende have a far higher natural radioactivity than that of any locality so far tested, so that Prof. Broadfoot believes they might throw some light on the question, either through effects on organisms brought in and purposely exposed, or through observation of changes in the natural fauna and flora of the region.

A drawback is the great distance from the nearest centers of biological research, traversable for all practical purposes only by airplane, and the consequent high cost of making such experiments and observations.

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ASTRONOMY

New Long-Time Clock Is Rotation of Milky-Way

Occurring Every Four Hundred Million Years, Revolution Of Great Galaxy of Stars Would Supplement That of Earth

A NEW CLOCK for measuring long periods of time may prove the rotation of the great galaxy of stars in which the solar system is located, Prof. Robert H. Baker, director of the University of Illinois Observatory, suggested in an address during the dedication of the new building housing the great Harvard collection of four hundred thousand astronomical photographs.

The revolution of the Milky Way, which occurs about once in four hundred million years, would supplement the rotation of the earth, which measures the day, and the swing of the earth around the sun, that measures the year.

When the dinosaurs existed, some two hundred million years ago, Prof. Harlow Shapley, director of the Harvard College Observatory, said in commenting, the solar system was on the other side of the galaxy.

The age of the earth is not less than eighteen hundred million years, and probably about two thousand million years, as measured by the radioactive clock, Prof. Arthur Holmes of Durham College, England, told the astronomers. Accurate determinations of the amount of helium in rocks give the geologist information on their age, because helium is given off at a known rate by the disintegration of radioactive uranium and thorium elements in the rocks.

The oldest known rocks exist in North America. Up until a few weeks ago uraninite from the Black Hills, S. D., held the record with 1460 million years of age, but radium-bearing rock from the radium bonanza at Bear Lake in northern Canada has shown nearly the same age, and rock from Manitoba assays an age of eighteen hundred million years. As these rocks were molten when laid down and injected into existing rocks, the rocks around them must be even older.

With increasing age the earth is not getting any feebler in energy, Prof. Holmes observed. In fact, in the Tertiary age, which led up to the appearance of man, the earth seems to have been more active than in earlier ages.

New estimates of the age of the earth have disturbed the astronomer's confidence in the stability of the solar system, Prof. E. W. Brown of Yale declared. Although he feels no concern about the immediate safety of the earth, he cannot tell just what it was doing two thousand million years ago when its crust was formed. Prof. P. W. Bridgman of Harvard warned that it was unsafe to theorize as to what had happened thousands of millions of years in the past and what would happen far in the future because we have only a few hundred years on which to base ideas.

Science News Letter, April 2, 1932

ETHNOLOGY

Monte Alban Neighborhood Stirred by Ghost Legends

NEW TALES of ghostly doings are stirring the countryside around Monte Alban, scene of recent treasure-tomb discoveries.

Long before Mexican archaeologists entered "Tomb Number Seven" at the ancient ruined city and found gold and pearls and other Indian treasures, there were legends. It was whispered that a hollowed gourd filled with gold could be seen, appearing magically in the middle of a phantom lake at Monte Alban. Other legends told of spirits who walked in the ruins carrying away gold.

Now that treasure has been found, and the Oaxacan imagination has been stirred, new legends are being generated. It is said that the guardians of the ruins see a phantom market which appears at midnight. The scene before them is the old Monte Alban, as it was in ancient times. Those who see and do not believe become enchanted and mysteriously disappear, the story goes. But those who do believe come to no harm.

A soldier stationed with the military guard tells another strange story. A female dog and her puppies come out of a secret passage of a mound, he says, but they disappear when any one approaches.

Science News Letter, April 2, 1932

PHYSIOLOGY

Sexless Humans and Artificial Giants Visioned for Future

Discovery Made That Vital Secretions of Pituitary Gland Can Be Separated and Allowed to Act Independently

A GLIMPSE into the future when sexless human beings will be produced and when short people can be made tall by injections of a growth-promoting hormone was given by Prof. Herbert M. Evans of the University of California in his presidential address to the American Association of Anatomists at New York.

Before taking the distinguished anatomical research scientists into such a future as H. G. Wells might describe, Prof. Evans, known as the discoverer of the antisterility vitamin E and for his work on hormones, announced the following important discoveries made by himself and his co-workers at Berkeley:

1. The pituitary gland, situated in the exact center of the head, produces in its front portion two distinct kinds of powerful secretions or hormones, one of which is growth-promoting and the other sex gland stimulating.

2. The growth hormone injected daily into animals from which the pituitary gland has been removed turns them into normal sized, sleek coated, active and healthy animals possessing an undeveloped infantile sexual system. This creation of adult creatures without a developed sexual system is a proof of the

separation of the growth-promoting hormone from the sex-stimulating hormone which is accomplished by very precise chemical process.

3. The growth hormone is strangely converted into the sex-stimulating hormone by means of the chemical substance found in the urine of pregnancy.

4. An overdose of growth hormone produces diabetes in normal animals.

5. The growth hormone not only promotes growth but it is also a necessary stimulus for some other sister glands of the body, notably the adrenal. Dr. Evans' work shows that his growth hormone is needed in some mysterious way by the adrenal cortical tissue before it can manufacture its own hormone that cures Addison's disease and is necessary to normal life. The adrenal cortex hormone was recently purified for clinical application by Dr. W. W. Swingle at Princeton and Dr. Frank A. Hartman at Buffalo. Dr. Evans' work shows that the growth hormone is the secretion of the pituitary which stimulates the adrenal and thyroid.

The growth-promoting hormone has already been applied to at least one human case of dwarfism, although Dr. Evans did not comment on this case in

his address. A young girl suffering from arrested development was given injections and her height increased about four inches.

"It is said that the Mikado wished to add to the stature of the Japanese soldiers," said Prof. Evans commenting on his work. "This growth-promoting hormone should be able to do it, but even the Mikado could not pay the price that it would cost at present. The cost of producing the growth pituitary hormone is prohibitive. It may take a decade to determine its formula and even longer for the chemist to make it in the form of pretty white crystals with coal tar as the raw material. We are the faint beginners in this work. Perhaps Science Service will write the story in 1955."

Unlike Alice in Wonderland, once growth is attained, shrinking can not be accomplished. Some feel that growth might be arrested by injuring the pituitary anterior lobe by X-rays or some other method but this would be a very dangerous procedure.

His production of full normal growth in animals without sex development by means of the growth hormone caused Prof. Evans to remark:

"Writers like H. G. Wells, Julian Huxley, and J. B. S. Haldane might explain that one of the greatest social problems to which man is heir could be solved by transferring this achievement to the human race."

The production of diabetes by an overdose of growth hormone was a big surprise in Dr. Evans' work although it had been known that animals without pituitary glands were unusually sensitive to insulin, the hormone used to combat diabetes.

At his Berkeley, Calif., laboratories Dr. Evans had the assistance of the operative skill of Richard Pencharz, the chemical genius of Karl Meyer and the biological analytical work of Miriam Simpson. A decade of work on the growth hormone led up to the present discoveries. Prof. Evans gave great credit to other workers in the same field, particularly to Prof. P. E. Smith, of Columbia University, who detected precocious sexuality after portions of the pituitary gland had been implanted in rats deprived of their own pituitary glands.

"Because of its manifold relations," said Prof. Evans, "the growth hormone will now surely be conceded to be one of the most important secretions of the body. It has basic physiologic importance quite apart from being essential to growth."

Science News Letter, April 2, 1932

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ANTHROPOLOGY

Modern Diet Blamed For Widespread Tooth Decay

STRIKING evidence that the modern diet of American civilization causes dental decay was presented before scientists gathered in Washington at the meeting of the American Association of Physical Anthropologists.

Two scientists of the National Museum staff told how they have systematically counted carious teeth in hundreds of jawbones of prehistoric Eskimos and in the mouths of living Eskimos in Alaska.

The ancient Eskimos were meat eaters living chiefly on walrus, seal, and fish, with only a little vegetable food. In 800 jawbones of these prehistoric people, M. S. Goldstein found only 6.5 per cent. with defective lower molars. He selected these molars to count because they are the first teeth of the jaw to succumb to decay. Most of the diseased spots were no more than pinhead size, he stated.

Henry B. Collins, Jr., reported examining the teeth of 296 living Eskimos. He found 26 per cent. of them with more or less serious dental decay.

"The significant fact," Mr. Collins explained, "is that in remote, barren regions of Alaska today where the Eskimos are poverty-stricken, they still live in the old-fashioned way as seal hunters and fishermen. And these living Eskimos practically do not know what toothache is like. But Eskimos living in proximity to white settlements show a much higher incidence of dental decay. At Nome we find more than half the natives with carious teeth."

"In the teeth of those Eskimos who supplement their native sea food diet to a greater or less extent with food that the white men eat, dental decay is prevalent, and is directly proportionate to the extent that the diet has been altered."

Science News Letter, April 2, 1932

Science on the Radio

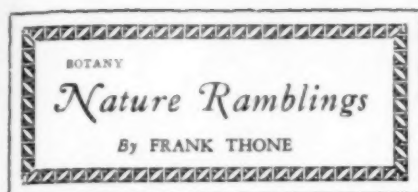
Science Service Presents Over the Radio in the Weekly Address

DR. JOHN H. PITMAN

Of the Sproul Observatory, Swarthmore College, Pa., whose subject will be "David Rittenhouse: Astronomer and Patriot."

Friday, April 8, at 3:45 P. M., Eastern Standard Time

Over Stations of
The Columbia Broadcasting System



Buttercup

BOTANISTS have given the buttercup the generic name *Ranunculus*, which means a little frog; even learned men will have their mild little jokes, and the way some buttercups squat down by the waterside must have appealed zoologically to some of the early students of plants who first went about, like later Adams in the garden, distributing names. Only Adam didn't use Latin—it hadn't been invented in his time.

But the pretty yellow flowers that run close to violets and spring beauties as favorites with children are by no means confined to ponds and marshes, like the familiar frogs. If one insists in dragging the frog-name after the buttercup, one must remember also the upland-dwelling tree-frogs that can be found even on the hilltops, for the buttercups are there, too.

The secret of this wide distribution is that there are many different kinds of buttercup, and some of them like it wet, and some of them like it dry. There is the water-buttercup, to take an extreme example, that lives in the water up to its chin, with most or all of its leaves submerged, and only the tops of its stems appearing above the surface to produce its flowers. Then there are swamp buttercups, that grow on land all right, but on land that is so soggy that another teacupful of water would turn it fluid. The great majority of buttercups, perhaps, are sensible folk like the rest of us, and prefer land that is neither too wet nor too dry—land that would be good for farming. And finally, there are some with a streak of Arab in them, that like to grow in dry places.

Any given locality will have several of these varied species. It is great sport to walk from marshy pond-edge to dry hill-top, spotting buttercups as you go.

Science News Letter, April 2, 1932

General Science

• Booklists of the A. A. A. S.

Following is a continuation of the booklists of the American Association for the Advancement of Science, compiled by Joseph L. Wheeler, chairman of the Association's booklist committee. The first groups of titles appeared in the SCIENCE NEWS LETTER for March 12; others will be printed at short intervals. The lists as printed here have been changed slightly from their original form, to include important new publications. The full set of twenty-seven annotated lists can be obtained by sending thirty cents in stamps to the American Association for the Advancement of Science, Smithsonian Institution, Washington, D. C.

Exploring for Science

Biologist in the Field

- Beebe, C. W. The Arcturus adventure 439p. 1926 Putnam \$7.50.
 Beebe, C. W. Galapagos, world's end 443p. 1924 Putnam \$6.00.
 Guenther, Konrad A naturalist in Brazil 400p. 1931 Houghton \$5.00.
 Hornaday, W. T. Camp-fires in the Canadian Rockies 353p 1906 Scribner \$5.00.
 Chapman, F. M. Camps and cruises of an ornithologist 432p. 1908 Appleton \$4.00.
 Chapman, F. M. My tropical air castle; nature studies in Panama 416p. 1929 Appleton \$5.00.
 Miller, L. E. In the wilds of South America 424p. 1918 Scribner \$6.00.
 Hingston, R. W. G. A naturalist in Hindustan 292p. 1923 Witherby 16 s.
 Darwin, C. R. Journal of the voyage of H. M. S. Beagle round the world various editions.
 Bates, H. W. The naturalist on the river Amazon 394p. (1863) 1910 Everyman's Lib. Dutton \$.90.
 Smithsonian Institution Explorations and field-work 1915 to date The Institution Gratis

Botanist in the Field

- Fairchild, D. G. Exploring for plants 591p. 1930 Macmillan \$5.00.
 Ward, F. K. The romance of plant hunting 275p. 1924 Longmans \$5.00.
 Wilson, E. H. Plant hunting 524p. 2v. 1927 Stratford \$15.00.

Geologist in the Field

- Griggs, R. F. The Valley of Ten Thousand Smokes 341p. 1922 National Geographic Society \$3.00.
 Willis, Bailey. Living Africa; a geologist's wanderings through the Rift Valleys 320p. 1930 McGraw-Hill \$4.00.
 Powell, J. W. First through the Grand Canyon 320p. 1925 Macmillan \$2.00.
Searching for Ancient Man
 Andrews, R. C. On the trail of ancient man 375p. 1926 Putnam \$6.00.
 Sawtell, R. O. and Treat, Ida Primitive hearths in the Pyrenees 307p. 1927 Appleton \$3.00.

Wonders of the Sky

Guides

As most people become interested in astronomy through what they see in the heavens, three star guides are listed first. Mention should also be made of the usefulness to the amateur of having a planisphere—a polar projection of the heavens on a flat chart turning about the pole, so that when set by directions, it shows the stars that are visible at any given date and hour.

"The Monthly Evening Sky Map" is a periodical (367 Fulton Street, Brooklyn, N. Y. \$1.50) which contains not only current maps of the heavens but news items and more detailed and dependable information than the brief notes sometimes given in newspapers.

- Murphy, E. G. (Kelvin McKready) A beginner's star-book 150p. 2d ed. rev. 1927 Putnam \$5.00.
 Barton, S. G. and W. H. A guide to the constellations 74p. 1928 McGraw-Hill \$3.00.
 Olcott, W. T. and Putnam, E. W. Field book of the skies 534p. 1929 Putnam \$3.50.

General Works

- Martin, M. E. The friendly stars 264p. 1907 Harper \$2.00.
 Shapley, Harlow and Payne, C. H. eds. The universe of stars 198p. 2d ed. rev. 1929 Harvard Univ. Observatory \$2.00.
 Chant, C. A. Our wonderful uni-

verse 191p. new ed. 1931 World Book Co. \$1.52.

- Jeans, Sir J. H. The universe around us 241p. new ed. 1931 Macmillan \$4.50.
 Phillips, T. E. R., and Steavenson, W. H., eds. Splendour of the heavens (Hutchinson's) 980p. 2v. in 1 reprinted 1931 McBride \$8.50.

Special Aspects of Astronomy

- Lewis, Mrs. I. E. M. Handbook of solar eclipses 118p. 1924 Duffield \$1.50.
 Serviss, G. P. The story of the moon 248p. new ed. 1928 Appleton \$3.00.
 Abbot, C. G. The sun 433p. 2d ed. rev. 1929 Appleton \$3.00.
 Proctor, Mary The romance of the planets 248p. 1929 Harper \$2.50.
 Jeans, Sir J. H. The stars in their courses 173p. 1931 Macmillan \$2.50.
 Olcott, W. T. Star lore of all ages 453p. 1911 Putnam \$5.00.
 Eddington, Sir A. S. Stars and atoms 127p. 1927 Yale Univ. Press \$2.00.
 Olivier, C. P. Meteors 276p. 1925 Williams & Wilkins \$6.00.
 Olivier, C. P. Comets 245p. 1930 Williams & Wilkins \$3.50.
 Shapley, Harlow Flights from chaos; a survey of material systems from atoms to galaxies 168p. 1930 McGraw-Hill \$2.50.
 Ingalls, A. G., and others Amateur telescope making 372p. 2d ed. 1928 Scientific American \$3.00.

History and Biography

- Stetson, H. T. Man and the stars 221p. 1930 McGraw-Hill \$2.50.

Texts

- Baker, R. H. Astronomy 521p. 1930 Van Nostrand \$3.75.
 Duncan, J. C. Astronomy; a textbook 435p. 2d ed. rev. 1930 Harper \$3.75.
 Moulton, F. R. Astronomy 549p. 1931 Macmillan \$3.75.
 "Astronomy" by Russell, Dugan and Stewart, in two volumes, (v.1 The solar system, 410p. 1927; v.2 Astrophysics and stellar astronomy, 482p. 1927. Ginn, \$2.50 each), is a more advanced and elaborate work.

Science News Letter will secure for its subscribers any book or magazine published in the United States. Send check or money order to cover regular retail price (\$5 if price is unknown, change to be remitted) and we will pay the postage. Address: Library, Science Service, 21st and Constitution Avenue, Washington, D. C.